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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,417	08/20/2003	Jack Hwang	ITL.0764D1US (P14416D)	6957
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TROP, PRUNER & HU, P.C. Suite 100 8554 Katy Freeway Houston, TX 77024				
EXAMINER PRENTY, MARK V				
ART UNIT		PAPER NUMBER		
2822				
DATE MAILED: 04/28/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/644,417	Applicant(s) HWANG ET AL.	
	Examiner MARK V PRENTY	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on 20 August 2003.

2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 11-24 is/are pending in the application.

    4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 11-24 is/are rejected.

7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 20 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	6) <input type="checkbox"/> Other: _____

This Office Action is in response to the papers filed on August 20, 2003.

The specification's reference (on page 1) to the parent application should be amended/updated to include its patented status.

Claims 11, 16, 18 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee (United States Patent 5,266,510).

With respect to independent claim 11, Lee discloses (see the entire reference, including the Fig. 8 disclosure) a semiconductor structure comprising: a gate 61; and an implanted region 63 including both germanium (via implanted germanium layer 45 – see column 2, line 59, through column 3, line 2) and P-type impurities (i.e., the boron implanted in Fig. 7).

Claim 11 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

With respect to dependent claim 16, Lee's implanted region 63 is a source/drain extension (see column 3, lines 39-42).

Claim 16 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

With respect to dependent claim 18, Lee's structure includes a polysilicon gate 61 (see column 3, lines 35-38).

Claim 18 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

With respect to dependent claim 19, Lee's structure includes a polysilicon gate 61 with sidewall spacers 65 (see column 3, lines 35-45).

Claim 19 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

Claims 11, 15 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu (United States Patent 6,319,798 – hereafter Yu '798).

With respect to independent claim 11, Yu '798 discloses (see the entire reference, including the Fig. 7 disclosure) a semiconductor structure comprising: a gate 16; and an implanted region 52 including both germanium (via implanted germanium region 38 –see column 3, lines 29-38) and P-type impurities (i.e., the boron implanted in Fig. 7 – see the paragraph bridging columns 3 and 4).

Claim 11 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '798.

With respect to dependent claim 15, Yu '798's germanium is implanted to a depth greater than about 150 Angstroms (see column 3, lines 29-38).

Claim 15 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '798.

With respect to dependent claim 16, Yu '798's implanted region 52 is a source/drain extension (see the paragraph bridging columns 3 and 4).

Claim 16 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '798.

Claims 11-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu (United States Patent 6,368,947 – hereafter Yu '947).

With respect to independent claim 11, Yu '947 discloses (see the entire reference, including the Fig. 2 disclosure) a semiconductor structure comprising: a gate

36; and an implanted region 40 including both germanium (see column 5, lines 38-62) and P-type impurities (i.e., boron - see column 5, lines 63-67).

Claim 11 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 12, Yu '947's ratio of germanium to P-type impurities is greater than one to one (see column 5, lines 55-57 and 63-67).

Claim 12 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 13, Yu '947's ratio of germanium to P-type impurities is approximately four to one (see column 5, lines 55-57 and 63-67).

Claim 13 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 14, Yu '947's P-type impurities are boron impurities (see column 5, lines 63-66).

Claim 14 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 15, Yu '947's germanium is implanted to a depth greater than about 150 Angstroms (see column 5, lines 38-42).

Claim 15 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 16, Yu '947's implanted region 40 is a source/drain extension (see Fig. 3 together with column 4, lines 22-30).

Claim 16 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 17, Yu '947's implanted region 40 is a strained (by virtue of the germanium implant being higher than the boron implant – see column 5, lines 55-57 and 63-67) source/drain junction (see the Abstract, for example).

Claim 17 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 18, Yu '947's structure includes a polysilicon gate 36 (see column 5, lines 1-2).

Claim 18 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 19, Yu '947's structure includes a polysilicon gate 36 with sidewall spacers 32 (see column 5, lines 1-2 and 8).

Claim 19 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to independent claim 20, Yu '947 discloses an integrated circuit (see the entire patent, including the Fig. 2 disclosure) comprising: a semiconductor structure 14; a gate 36 formed on said semiconductor structure; and a source 40 and a drain region 40, said source and drain region including both germanium (see column 5,

lines 38-62) and a P-type impurity (i.e., boron - see column 5, lines 63-67), said source and drain region being strained (by virtue of the germanium implant being higher than the boron implant – see column 5, lines 55-57 and 63-67).

Claim 20 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 21, Yu '947's ratio of germanium to P-type impurities is greater than one to one (see column 5, lines 55-57 and 63-67).

Claim 21 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 22, Yu '947's ratio of germanium to P-type impurities is approximately four to one (see column 5, lines 55-57 and 63-67).

Claim 22 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 23, Yu '947's P-type impurities are boron impurities (see column 5, lines 63-66).

Claim 23 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

With respect to dependent claim 24, Yu '947's implanted region 40 is a source/drain extension (see Fig. 3 together with column 4, lines 22-30).

Claim 24 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yu '947.

Claims 11-15, 18 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Brown et al. (United States Patent 6,486,510 – hereafter Brown).

With respect to independent claim 11, Brown discloses (see the entire reference, including the Fig. 5 disclosure) a semiconductor structure comprising: a gate 14; and an implanted region 12 including both germanium (see column 3, lines 3-26) and P-type impurities (see the sentence bridging columns 2 and 3).

Claim 11 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Brown.

With respect to dependent claim 12, Brown's ratio of germanium to P-type impurities is greater than one to one (see column 3, lines 3-18 and the sentence bridging columns 2 and 3).

Claim 12 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Brown.

With respect to dependent claim 13, Brown's ratio of germanium to P-type impurities is approximately four to one (see column 3, lines 3-18 and the sentence bridging columns 2 and 3).

Claim 13 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Brown.

With respect to dependent claim 14, Brown's P-type impurities are boron impurities (see the sentence bridging columns 2 and 3).

Claim 14 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Brown.

With respect to dependent claim 15, Brown's germanium is implanted to a depth greater than about 150 Angstroms (see column 3, lines 3-12).

Claim 15 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Brown.



With respect to dependent claim 18, Brown's structure includes a polysilicon gate 14 (see column 3, lines 39-41).

Claim 18 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Brown.

With respect to dependent claim 19, Brown's structure includes a polysilicon gate 14 with sidewall spacers 16 (see column 3, lines 39-41 and 54-57).

Claim 19 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Brown.

Claims 11, 16-20, 23 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al. (United States Patent Application Publication US 2002/0086502 – hereafter Liu).

With respect to independent claim 11, Liu discloses (see the entire reference, including the Fig. 6 disclosure) a semiconductor structure comprising: a gate 106; and an implanted region 122 including both germanium (see paragraph [0016]) and P-type impurities (see paragraph [0017]).

Claim 11 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

With respect to dependent claim 16, Liu's implanted region 122 is a source/drain extension (see paragraph [0018]).

Claim 16 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

With respect to dependent claim 17, Liu's implanted region 122 is a strained (by virtue of the germanium and boron implants being different) source/drain junction (see paragraph [0018]).

Claim 17 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

With respect to dependent claim 18, Liu's structure includes a polysilicon gate 106 (see paragraph [0015]).

Claim 18 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

With respect to dependent claim 19, Liu's structure includes a polysilicon gate 106 (see paragraph [0015]) with sidewall spacers 124 (see paragraph [0022]).

Claim 19 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

With respect to independent claim 20, Liu discloses an integrated circuit (see the entire patent, including the Fig. 6 disclosure) comprising: a semiconductor structure 102; a gate 106 formed on said semiconductor structure; and a source 126 and a drain region 126, said source and drain region including both germanium (see paragraph [0016]) and a P-type impurity (see paragraph [0017]), said source and drain region being strained (by virtue of the germanium and P-type impurity implants being different – see paragraphs [0016] and [0017]).

Claim 20 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

With respect to dependent claim 23, Liu's P-type impurities are boron impurities (see paragraph [0017]).

Claim 23 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

With respect to dependent claim 24, Liu's implanted region 122 is a source/drain extension (see paragraph [0018]).

Claim 24 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Liu.

Hwang et al. (United States Patent 6,638,802) is related to this application.

Art Unit: 2822

Registered practitioners can telephone the examiner at (571) 272-1843. Any voicemail message left for the examiner must include the name and registration number of the registered practitioner calling, and the Application/Control (Serial) Number. Technology Center 2800's general telephone number is (571) 272-2800.

*Mark Prenty*  
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**Primary Examiner**